SUPPLEMENTS TO THE JAPANESE CAPRELLID FAUNA. I. CAPRELLIDS FROM THE KOREAN STRAITS AND ADJACENT WATERS

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SUPPLEMENTS TO THE JAPANESE CAPRELLID FAUNA. I. CAPRELLIDS FROM THE KOREAN STRAITS AND ADJACENT WATERS

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With Text-figures 1–12

An interesting collection of caprellids, selected from 34 benthos samples collected in the years 1968–1970 by the Seikai Regional Fisheries Laboratory in the Korean Straits, western waters off Kyushu Island, Yellow Sea and East China Sea, was submitted to me for identification by Dr. Reizo Ishiyama, Professor Emeritus of Tokyo University of Fisheries. The benthos samples were mostly taken from the sandy bottom by an open net with the mouth of 60 cm × 90 cm and 3 m in length.

The following 14 species were found in the collection, of which 8 species marked with an asterisk were new to Japan and moreover 4 of them were new to science. Further, a new genus was established, basing on one of these new species.

* 1. *Phtisica marina* Slabber
* 2. *Protogeton incertus* Mayer
3. *Noculacia bogisa* Mayer
* 4. *Pretritella divina*, n. gen., n. sp.
5. *Heterocaprella clavigera* Arimoto
6. *Protella gracilis* Dana
* 7. *Paracaprella insolita*, n. sp.
* 8. *Propodalirius insolitus* Mayer
* 9. *Caprella* (*Caprella*) *bathyalis* Vassilenko
*10. *Caprella* (*Spinicephala*) *minuscula*, n. sp.
11. *Caprella* (*Spinicephala*) *scaura typica* Mayer
12. *Caprella* (*Spinicephala*) *gigantochir* Mayer
*13. *Caprella* (*Spinicephala*) *minima*, n. sp.
14. *Caprella* (*Spinicephala*) *simia* Mayer

Before going into the description, I want to express my special thanks to Messrs. Keisuke Okada and Yoichi Shojima of the Seikai Regional Fisheries Research Laboratory, and Dr. R. Ishiyama for the chance to examine the present important material. Also, I record here with my hearty thanks the very significant critical advices given by Dr. Takasi Tokioka and his kindness in reading the manuscripts.

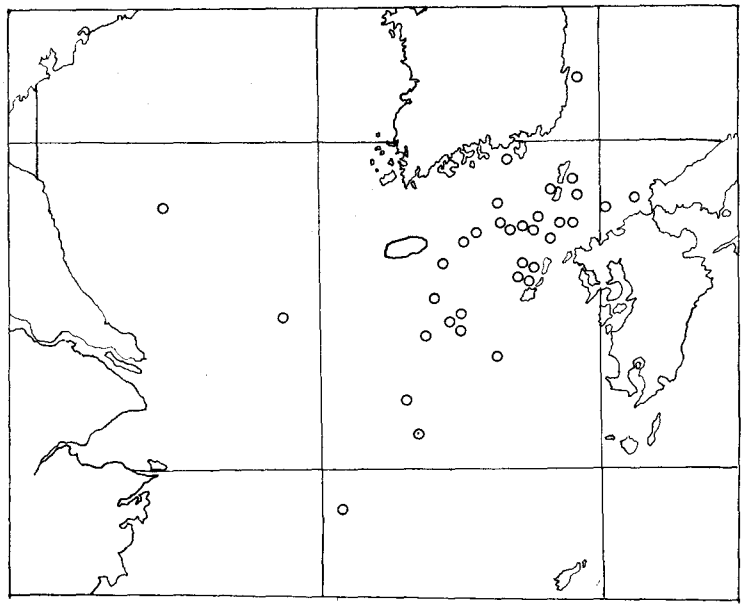

Fig. 1. Localities of caprellids in the present material.

1. *Phtisica marina* Slabber, 1769

(New Japanese name: Umi-warekara)

(Fig. 2)

Phitisica marina Slabber, 1769, Natuurk. Verlustigingen, (10): 79–83, pl. 10, figs. 1–3; Müller, 1775, Physicalische Belustigungen Slabber: 41–43; Stebbing, 1888, Rep. Voy. Challenger, Zool., 29(67): 32; Chevreux & Bouvier, 1893, Ann. Sci. nat. Paris, (7) (Zool.), 15: 142; G.O. Sars, 1895, Account Crust. Norway, 1: 646–648, Pl. 223; Walker, 1895, Proc. Trans. Liverpool Biol. Soc., 9: 319; Walker & Hornell, 1895, Journ. mar. zool. Microsc., 2(7): 54; Scott, 1897, Ann. Rep. Fish. Bd. Scotland, 15(3): 141; Walker, 1898, Proc. Trans. Liverpood biol. Soc., 12: 170; Gadeau de Kerville, 1898, Bull. Soc. nat. Rouen, 33: 348; Chevreux, 1899, C.R. Assoc. Franç, Av. sci., 27(2): 483; Beaumont, 1900, Proc. Roy. Irish Acad., (3), 5(5): 795; Chevreux, 1900, Res. Camp. sci. Monaco, 16: 118–119; Gadeau de Kerville, 1901, Bull. Sco. Amis. Sci. nat. Rouen, 36: 184; Scott, 1901, Ann. Rep. Fish. Bd. Scotland, 19(3): 267; Chevreux, 1902, C.R. Assoc. Franç. Av. sci., 30(2): 696; Norman, 1902, Ann. Mag. nat. Hist., (7), 10: 483; Mar. Biol. Assoc., 1904, Journ. mar. biol. Ass. U.K., n. ser., 7(2): 241; Sovinskii, 1904, Mem. Sco. nat. Kiew, 18: 96; Norman & Scott, 1906, Crust. Devon Cornwall: ix, 98; Scott, 1906, Proc. Roy. phys. Soc. Edinburgh, 16(4): 174; Norman, 1907, Ann. Mag. nat. Hist., (7), 20: 370; Norman, 1909, Rep. Trans. Guernsey Soc. nat. Sci., 5: 463; Norman & Brady, 1910, Trans. nat. Hist. Soc. Northumberland, n. ser., 3(2): 75; Stebbing, 1910, Ann. South African Mus., 6(4) 468; Nordgaard, 1912, Norsk. Vidensk. Selsk. Skr., 1911 (6): 24; Chichkoff, 1912, Arch. Zool. exp. gén., (5), 10(2): xxxv; Barnard, 1916, Ann. South African Mus., 15(3): 283–284; Chumley, 1918, Fauna Clyde Sea: 34, 165; Sparre Schneider, 1926, Tromsø Mus. Aarskr., 47(8): 58–59; Schellenberg, 1926, Deutsche Südpolar-Exped., 18 (Zool. 10): 465; Chevreux, 1927, Expéd. sci. Travailleur Talisman, Amphip.: 133–134; Schellenberg, 1927, Nordisches Plankton, 6: 721–722, fig. 104; Stephensen, 1927, Vidensk. Medd. Dansk. Naturh., 84: 145–146; Stephensen, 1927, Traomsø Mus. Skr., 1(5): 13; Stephensen, 1928, Danmarks Fauna, 32: 378–380, fig. 91 (1–10); Stephensen, 1929, Tierwelt Nord-Ostsee, 10(f): 176–177, fig. 328; Stephensen, 1929, Zoology Faroes, 23: 19, 34; Borcea, 1931, Ann. Sci. Univ. Jassy, 16(3–4): 677; Mar. Biol. Assoc., 1931, Plymouth Mar. Fauna: 198;

Schijfsma, 1931, Bilogic Zuiderzee tijdens Drooglegging, 3: 26; Fage, 1933, Arch. Zool. exp. gén., 76(3): 113, 115, 117, 119, 125–127, 225; Oldevig, 1933, Göteborgs Vetensk. Samh. Handl., (B), 3(4): 261, fig. 1; Chevreux, 1935, Rés. Camp. Sci. Monaco, 90: 132; Stephensen, 1935, Mém. Mus. Roy. Hist. Nat. Belgique, (2), 15: 78; Fiorencis, 1940, Thalassin, 4(6): 11–12, fig. 1, Pl. I, figs. 1–2; Goodhart & Harrison, 1940, Nature, 145(3664): 109; Bertrand, 1941, Bull. Lab. mar. Dinard, 23: 16; A. Cărăusu, 1941, Bull. Inst. coéanogr. Monaco, 803: 11; S. & A. Cărăusu, 1942, Ann. Sci. nat. Univ. Jassy, 28: 79–80; Motas & Popovici, 1942, Bull. Acad. Roum. Bucarest, 23: 446; Stephensen, 1942, Tromsø Mus. Skr., 3(4): 428–429, 502–503; Stephensen, 1944, Medd. Grønland, 121(14): 159; Dahl, 1946, Boll. Soc. Ent. Italiana, 76(7–8): 53; Enequist, 1949, Zool. Bidr. Uppsala, 28: 392, 402; Rancurel, 1949, Bull. Mus. Hist. nat. Marseille, 9(3): 168; Spooner, 1950, Journ. mar. biol. Ass. U.K., 29(1): 253; Reid, 1951, Atlantide Rep., 2: 281–282, 289; Ruffo & Wieser, 1952, Mem. Mus. Storia nat. Verona, 3: 21; S. Cărăusu, 1956, Ann. Stiint. Univ. Iasi, n. ser., (2, Biol.), 2(1): 132; Irie, 1958, Bull. Fac. Fish. Nagasaki Univ., 7: 89; A. & S. Cărăusu, 1959, Trav. Sta. zool. Agigea, 1956: 373–378; Irie, 1959, Bull. Fac. Fish. Nagasaki Univ., 8: tab. 4; S. Costa, 1960, Trav. Sta. zool. villefranche-sur-Mer, 19(19): 100; S. Costa, 1960, Trav. Sta. zool. Villefranche-sur-Mer, 19(20): 104; Gottlieb, 1960, Bull. Res. Coune. Israel, (B, Zool.), 9b(2–3): 161, 163–164; S. Costa, 1961, Ann. Inst. océanogr. Paris, n.ser., 39: 271; Riedl, 1963, Fauna Flora Adria: 320, fig. 109; Toulmond & Truchot, 1964, Trav. Sta. biol. Roscoff, Suppl., 24: 34; McCain, 1966, Galathea Rep, 8: 92; McCain, 1968, Bull. U.S. Nat. Mus., 278: 91–97, figs. 46-47, 54, 56; Pequegnat & Pequegnat, 1968, Res. Rep. Texas Agr. Univ., Oceanogr.: 24, 33; Krapp-Schickel, 1969, Zool. Jb. Syst., 6: 279, 346–347, 391, 413; Vassilenko, 1974, Skel. Shr. Soviet Terr. Water and Adj. Water, Acad. Nauk, 107: 94–96, fig. 47.

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Squilla ventricosa O.F. Müller, 1776, Zool. Dan. Prodr.: 197; Abildgaard, 1788, in Müller's Zoologia Danica, 2: 20–21, Pl. 56, figs. 1–3.

Gammarus pedatus Abildgaard, 1789, in Müller's Zoologia Danica, 3: 33–34, Pl. 101, figs. 1–2.

Caqncer (*Gammarellus*) *vetricosus* Herbst, 1793, Versuch Naturgesch. krabben Krebse, 2(4): 144–145, Pl. 36, fig. 11a–b.

Caprella ventricosa Lamarck, 1801, Syst. Anim. S. Vert.: 166; Bosc. 1801–1802, Hist. nat. Crust., 2: 156; Latreille, 1802–1803, Hist. nat. Crust., 6: 327; Latreille, 1803, Nouv. Dict. His . nat., 5: 333.

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Leptomera rubra Lamarck, 1818, Hist. nat. Anim. s. Vert. 1 ed., 5: 172; Bosc, 1830, Hist. nat. Crust., 2 ed., 2: 127; Lamarck, 1838, Hist. nat. Anim. s. Vert., 2 ed., 5: 295.

Proto Latreille, 1818, Tabl. encycl. mêth., 24: 9, Pl. 336, fig. 38.

Leptomera pedata Lamarck, 1818, Hist. nat. Anim. s. Vert., 1 ed., 5: 172–173; Bosc, 1830, Hist. ant. Crust., 2 ed., 2: 127–128; Guérin, 1836, Icon. Règne Anim. Cuvier, 2(Crust.): Pl. 28, fig. 3; Lamarck, 1838, Hist. nat. Anim. s. Vert., 2 ed., 5: 295; H. Milne-Edwards, 1840, Hist. ant. Crust., 3: 109; Kryøer, 1843, Naturhist. Tidsskr., 4(6): 607–613, Pl. 7, figs. 13–23; Rathke, 1843, Nova Acta Acad. Leop.-Carol., 20(1): 97–98; Guérin, 1844, Icon. Règne Anim. Cuvier, 3(Crust.): 25; Gosse, 1855, Man. mar. Zool. British Isles, 1: 131, fig. 224; V. Liljeborg, 1956, Svenska Vetensk. Akad. Forh., 12(3): 132; Snellen van Vollenhoven. 1860, Dieren van Nederland, Gelede Dieren: 27, Pl. 2, fig. 2; Meyer, Möbius, Karsten & Hensen, 1873, Zeitschr. ges. Naturwiss., 41: 271; Möbius, 1873, Jber. Comm. wiss. Unters. Deutsch. Meere, 1871: 117; Maitland, 1874, Tijdsckr. Nederl. dierk. Ver., 1(3): 245; Lenz, 1882, Jber. Comm. wiss. Unters. Deutsch. Meere, 4(2): 174.

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Proton pedatum Desmarest, 1823, Dict. Sci. nat., 28: 362, Pl. 46, fig. 3; Desmarest, 1825, Consid. gén. Class. Crust.: 276–277, Pl. 46, fig. 3; Bouchard Chantereaux, 1883, Catal. Crust. Boulonnais: 18.

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Cyamus (*Leptomera*) *pedata* Latreille, 1836, Das Thierreich, 2 ed., 4: 217.

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Proto pedata White, 1850, List. British Anim. British Mus., 4(Crust).: 61; Bate, 1856, Rep. British Ass. Adv. Sci., 25: 60; Bate, 1857, Ann. Mag. nat. Hist., (2), 19: 151; White, 1857, Pop. Hist. British Crust.: 218; Boeck, 1861, Forh. Skad. Naturf. København. 8: 670; McAndrew, 1861, List British mar. Fauna: 28; Bate, 1862, Catal. Amphip. Crust. British Mus.: 349–350, 382, Pl. 55, fig. 1; Bate & Westwood, 1868, Hist. British Crust., 2: 38–41, fig. 1; Norman, 1869, Rep. British Ass. Adv. Sci., 1868: 288; Brady & Robertson, 1869, Ann. Mag. nat. Hist., (4), 3: 361; Parfitt, 1873, Rep. Trans. Devonshire Ass. Adv. Sci., 6(1): 250; Bate, 1878, in Couch, Journ. Roy. Inst. Cornwall, 19: 508; Haller, 1879, Zool. Anz., 2(27): 230; Haller, 1880, Zeitschr. wiss. Zool., 33: 398; Hoek, 1879, Tijdschr. Nederl. dierk. Ver., 4: 97, 113–115, Pl. 5, fig. 10, Pl. 7, figs. 1–16, Pl. 8, figs. 1–3; Delage, 1881, Arch. Zool. exp., (A), 9(42): 133, 153, Pl. 10, fig. 7; Fowler, 1886, in Herdman, Proc. phil. Soc. Liverpool, 75(4): 217; Bate, 1888, in Heape, Journ. mar. biol. Ass. U.K., 1(2): 175; Sparre & Schneider, 1891, Tromsø Mus. Aarsh., 14: 111, 122; Walker, 1895, Ann. Mag. nat. Hist., (6), 15: 474; Ussing, 1952, Flora Fauna, 58(1–2): 45–47.

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Proto goodsiri Stebbing, 1879, Rep. Trans. Devonshire Ass. Adv. Sci., 11: 521; Chevreux, 1887, Bull. Soc. zool. France, 12: 318, 335.

Proto brunneovittata Haller, 1879, Zool. Anz., 2(27): 231; Haller, 1880, Zeitschr. wiss. Zool., 33: 399–400, Pl. 22, figs. 19–22; Mayer, 1882, Fauna Flora Golf. Neapel, 6: 25; Carus, 1885, Prodr. Faunae Mediterr., 1: 387; Mayer, 1890, Fauna Flora Golf. Neapel, 17: 14.

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Phytisca marina Crawshay, 1912, Journ. mar. biol. Ass. U.K., n.ser., 9(3): 351.

Proto ventricosa f. *typica* Monterosso, 1915, Atti. Accad. Gioen. Sci. nat. Catania, (5), 8: 3.

Proto ventricosa f. *gigantea* Monterosso, 1915, Atti. Accad. Gioen. Sci. nat. Catania, (5), 8: 3.

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Phtisica antillensis (not Mayer, 1903) Pequegnat, 1966, Res. Rep. Texas Univ., Oceanogr.: 25.

Occurrence. Korean Straits (34°10.1'N, 129°04.2'E), in benthos, 2 males and 1 female, Nov. 19, 1969, collected by Okada and Shojima, Coll. no. 712; Korean Straits (33° 39.3'N, 128°43.2'E), in benthos, 2 males and 2 females, Nov. 21, 1969, collected by Okada and Shojima, Coll. no. 715; Korean Straits (33°54.3'N, 128°25.0'E), in benthos, 1 male, Nov. 21, 1969, collected by Okada and Shojima, Coll. no. 751; Eastern Tsushima Islands (34°09.6'N, 129°21.2'E), in benthos, 1 male, Feb. 11, 1970, collected by Okada and Shojima, Coll. no. 714; Korean Straits (33°30.3'N, 128°02.3'E), in benthos, 2 males, Feb. 11, 1970, collected by Okada and Shojima, Coll. no. 724; Korean Straits (33°42.0'N, 128°47.8'E), in benthos, 1 male and 1 female, Feb. 11, 1970, collected by Okada and Shojima, Coll. no. 716; Korean Straits (33°53.6'N, 128°33.6'E), in benthos, 39 males and 18 females, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 718; East China Sea (33°40.2'N, 127°52.3'E), in benthos, 1 male, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 719; Korean Straits (33°30.3'N, 128°02.3'E), in benthos, 1 male, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 720; East China Sea (32°24.0'N, 127°24.8'E), in benthos, 49 males and 3 females, Feb. 15, 1970, collected by Okada and Shojima, Coll. no. 722; Korean Straits (34° 05.3'N, 128°21.0'E), in benthos, 3 females, Feb. 15, 1970, collected by Okada and Shojima, Coll. no. 723; East China Sea (32°06.1'N, 127°44.2'E), in benthos, 1 male, Feb. 15, 1970, collected by Okada and Shojima, Coll. no. 721; Eastern Goto Islands (33°40.6'N, 128°44.8'E), depth 0–50 m, 3 males, May 9, 1970, collected by Okada and Shojima, Coll. no. 713.

Description.

Male: Body 7 mm long (Fig. 2, Coll. no. 712); slender and smooth; pereonite V longest, other pereonites diminishing the length by a little in the order of VI, III and II.

Antenna 1 a little shorter than a half of body length, flagellum 17-segmented;

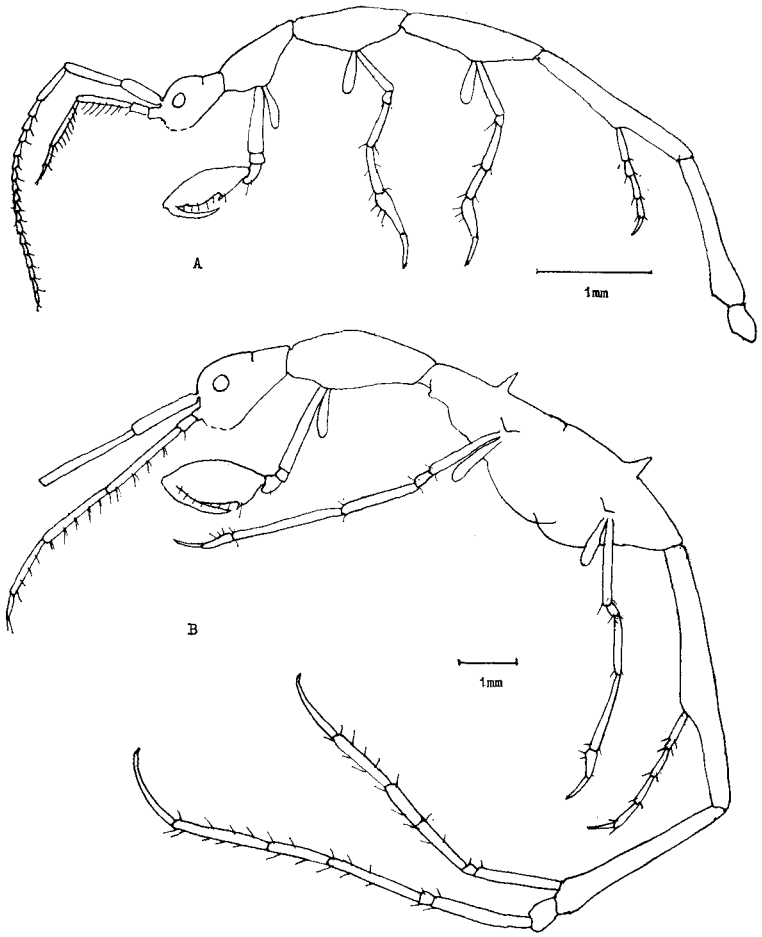

Fig. 2. *Phtisica marina* Slabber. A. male; B. adut female.

antenna 2 a little longer than peduncle of antenna 1. Terminal segment of mandibular palp with spines of I-X-I in formula. Gnathopod 2 attached to pereonite II a little anterior to the middle; basal segment a little shorter than pereonite II; propodus approximately twice as long as broad, proximally with slightly projecting palmar angle, a spine, 2 subspines and a tooth situated near the distal end.

Pereopods 3 and 4 elongate and 6-segmented; pereopod 5 attached to pereonite V slightly posterior to the middle, a little longer than a half of this pereonite, 5-segmented; pereopods 6 and 7 missing.

Gills elongate, on pereonites II, III and IV.

Abdominal appendages: two pairs of biarticulated ones.

Female: Body 17 mm long (Fig. 2, Coll. no. 726); pereonites III and IV with a dorsal tooth at the middle and a lateral tooth on each side above gill; propodus of gnathopod 2 without poison tooth on palmar margin; pereopods 3 and 4 long, slender, and 6-segmented; pereopod 5 slender but shorter, 5-segmented; pereopod 6 twice as long as

pereonite VI; pereopod 7 longer than pereopod 6.

Abdomen with two pairs of biarticulated appendages.

Distribution. Type locality: The Island Walcheren, province of Zeeland, the Netherlands. Other records: Northed Norway to the Mediterranean Sea; British Isles; Azorea; Canary Islands; Medierranean Sea; Black Sea; Tropical West Africa; Cape Hatteras, North Carolina to the Tortugas and West Coast of Florida to Panama City; St. John, virgin Islands; Cubagus and Margarita Island, Venezuela; Cape la vela, Columbia; 25°26.3'N, 80°02'W; Rio de Janeiro, Brazil; Japanese waters, Sasebo (Irie, 1958).

Remarks. Young females are devoid of the dorsal tooth on pereonites III and IV.

This species was shown already by Irie (1958, 1959) in the list of pelagic amphipods from the Japanese waters, but any descriptions of figures were not given. Thus, it was excluded from the monograph of Japanese caprellids published in 1976. Therefore, practically this might, be the first record of the species from the Japanese waters, accompanied with description and figures.

2. *Protogeton incertus* Mayer, 1903

(New Jap. name: Nagatenohira-warekara)

(Fig. 3)

Protogeton incertus Mayer, 1903, Siboga Exped. Mon., 34: 29, Pl. 9 fig. 12.

Occurrence. East China Sea (29°24.0'N, 125°29.6'E), depth 0–50 m, 1 male, Mar. 15, 1969, collected by Okada and Shojima, Coll. no. 732; Korean Straits (33°39.3'N, 128°43.2'E), in benthos, 1 male and 2 females, Nob. 21, 1969, collected by Okada and Shojima, Coll. no. 735; Korean Straits (33°54.3'N, 128°23.0'E), in benthos, 1 female, Nov. 21, 1969, collected by Okada and Shojima, Coll. no. 442; East China Sea (32° 21.8'N, 127°24.2'E), in benthos, 1 male, Nov. 23, 1969, collected by Okada and Shojima, Coll. no. 734; East Chechu Island (33°11.8'N, 127°17.8'E), in benthos, 4 males, Nov. 23, 1969, collected by Okada and Shojima, Coll. no. 739; Korean Straits (33°53.6'N, 128°33.4'E), in benthos, 22 males, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 733; Western Goto Islands (33°08.0'N, 128°32.1'E), in benthos, 1 female, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 730; East Chechu Island (33°07.7'N, 127°32.2'E), in benthos, 1 female, Feb. 13, 1970, collected by Okada and Shojima, Coll. no. 731; East China Sea (32°24.0'N, 127°24.8'E), in benthos, 22 males and 8 females, Feb. 15, 1970, collected by Okada and Shojima, Coll. no. 740; East China Sea (33°01.1'N, 126°31.6'E), depth 0–50 m, 3 males and 1 female, Mar. 13, 1970, collected by Okada and Shojima, Coll. no. 738; Korean Straits (34°55.9'N, 128°16.4'E), in benthos, 20 males and 5 females, Nov. 21, 1970, collected by Okada and Shojima, Coll. no. 737.

Description.

Male: Body 14 mm long (Fig. 3, Coll. no. 734), smooth; head rounded above, eyes large; pereonites II-V subequal in length, pereonite VI a little shorter than V.

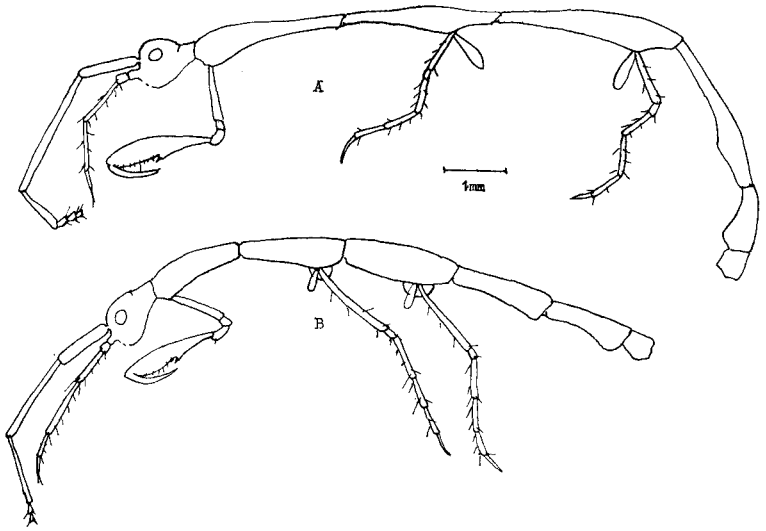

Fig. 3. *Protogeton incertus* Mayer. A. male; B. female.

Flagellum of antenna 1 was torn off but left 3 segments on peduncle; antenna 2 shorter than peduncle of antenna 1. Mandibular palp 2-segmented, with a spine on terminal segment. Gnathopod 2 attached to pereonite II near the fore end; basal segment a little shorter than pereonite II, propodus very long, a little shorter than twice the length of basal segment, five times as long as broad, markedly narrowed basally, with a grasping palmar spine at the middle fringed with small spines and spinules along the distal margin of palm.

Pereopods 3 and 4 attached to the hind part of pereonites III and IV respectively 6-segmented; pereopods 5, 6 and 7 missing.

Gills elongate, on pereonites III and IV.

Young female: Body 10 mm long (Fig. 3, Coll. no. 731), smooth; pereopods 3 and 4 a little shorter than twice the length of pereonites III and IV respectively, with a pair of small oostegites on the ventrolateral side of these pereonites.

Distribution. Type locality: Koh Chuen, Thailand.

Remarks. This is the first record of the species from the Japanese water. Mayer (1903) gave one figure, of the mandibuller palp, as to this species.

3. *Noculacia bogisa* Mayer, 1903

(Jap. name: Senakafutatoge-warekara Arimoto)

(Fig. 4)

Occurrence. Korean Straits (34°10.0'N, 129°00.4'E), in benthos, 1 female, Feb. 19, 1969, collected by Okada and Shojima, Coll. no. 703; Korean Straits (33°54.3'N, 128°25.0'E), in benthos, 15 males, Nov. 21, 1969, collected by Okada and Shojima,

Coll. no. 702; Korean Straits (33°53.6'N, 128°33.4'E), in benthos, 25 males and 14 females, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 704; Korean Straits (33°53.6'N, 128°33.4'E), in benthos, 18 males and 2 females, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 710; Korean Straits (33°05.9'N, 128°16.4' E), in benthos, 1 male, Nov. 21. 1970, collected by Okada and Shojima, Coll. no. 711; Korean Straits (34°05.3'N, 128°21.0'E), in benthos, 7 males and 2 females, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 707; Eastern Chechu Island (33° 40.2'N, 127°52.3'E), in benthos, 1 male and 1 female, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 708; East China Sea (32°24.0'N, 127°24.8'E), in benthos, 5 males and 1 female, Feb. 15, 1970, collected by Okada and Shojima, Coll. no. 706; East China Sea (33°06.1'N, 127°44.2'E), in benthos, 1 male, Feb. 15, 1970, collected by Okada and Shojima, Coll. no. 706; Western Goto Islands (33°40.6'N, 128°44.8'E), depth 0–50 m, 1 female, May 9, 1970, collected by Okada and Shojima, Coll. no. 705.

Description.

Male: Body 11 mm long (Fig. 4. Coll. no. 702); pereonite V longest, II shorter than III; head with an acute frontal dorsal spine; pereonite I with an acute dorsal spine at the hind end; II with a dorsal spine at the hind end, a pair of similar spines at the middle, and strong anteriorly pointed ventral spine between the base of gnathpod 2; III with a dorsal spine at the hind end and a ventro-lateral tooth on each side near the fore end, IV with a ventro-lateral tooth on each side near the fore end.

Antenna 1 a little shorter than body length, flagellum 12-segmented; antenna 2

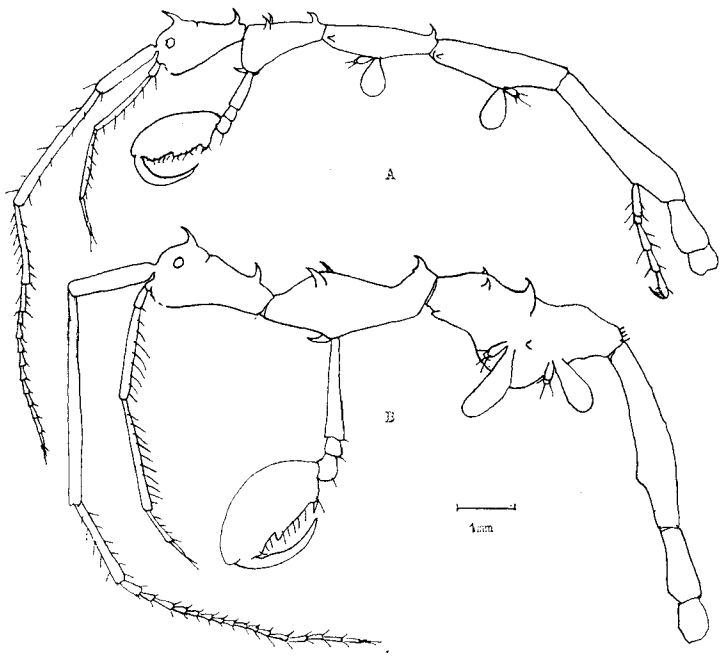

Fig. 4. *Noculacia bogisa* Mayer. A. male; B. female.

a little shorter than peduncle of antenna 1. Palp of mandible 3-segmented, formula of spines of terminal segment 1-X-1. Gnathopod 2 attached to pereonite II near the fore end; basal segment shorter than pereonite II; propodus twice as long as broad, palmar angle bearing a spine, poison tooth medial.

Pereopods 3 and 4 very small and 2-segmented, pereopod 5 slender and subequal to pereonite V in length, and 6-segmented, pereopods 6 and 7 missing.

Gills oblong.

Abdomen, with a pair of lobes.

Female: Pereonite III armed with a pair of dorsal spines in the middle; abdomen with a pair of lobes.

Type localities: Pulu Jedan, Arafura Sea. Koh Krau, Thailand.

Remarks. This is the first record of Japan for Mayer's.

Pretritella n. gen.

Diagnosis. Flagellum of antenna 2 biarticulated; mandibular palp 2-segmented; molar absent; pereopods 3 and 4 2-segmented; pereopod 5 6-segmented; gills on pereonites III and IV; male abdomen with a pair of lobes.

Type species. Pretritella divina n. sp.

Remarks. The present new genus is related most closely to *Proliropus* in that the pereopods 3 and 4 are 2-segmented and the male abdomen is furnished with a pair of lobes, but the former differs distinctly from the latter in the absent the molar.

4. *Pretritella divina* n. sp.

(New Jap. name: Kami-warekara)

(Fig. 5)

Occurrence. Korean Straits (33°45.0'N, 128°23.0'E), in benthos, 1 male, Nov. 21, 1969, collected by Okada and Shojima, Coll. no. 517; Korean Straits (33°53.6'N, 128°33.4'E), in benthos, 1 male, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 517.

Description.

Male: Holotype: Body 2.5 mm long (Fig. 5. Coll. no. 517), smooth; pereonites II-V subequal in length, pereonite VI shorter than V, I shorter than VI.

Antenna 1 a little shorter than body length, flagellum 12-segmented; antenna 2 subequal to peduncle of antenna 1. No molar tubercle on mandible, mandibular palp 2-segmented, terminal with 2 setae.

Gnathopod 2 attached to the front part of pereonite II; basal segment small and short, propodus a little more than twice as long as broad, basally palm with a long grasping spine, poison tooth nearly medial and very small.

Pereopods 3 and 4 2-segmented; 5–7 6-segmented; pereopod 5 about twice as long as pereonite V, propodus with two grasping spines on palmar margin.

Abdomen with a pair of lobes in male.

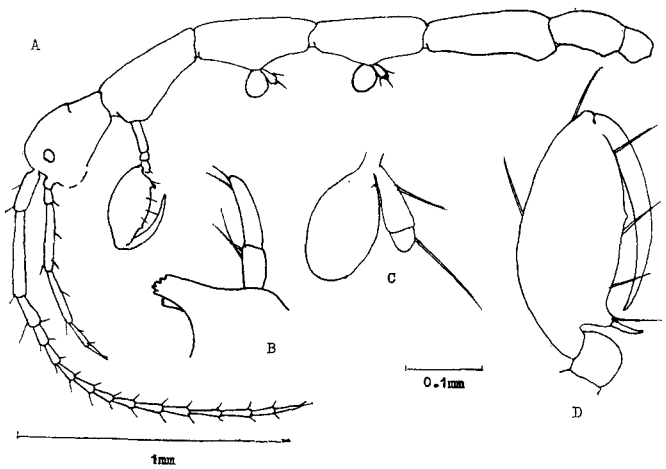

Fig. 5. *Pretritella divina* n. gen. and n. sp. A. male; B. mandible; C. gill and pereopod 3; D. propodus of gnathopod 2.

5. *Heterocaprella clavigera* Arimoto

(Jap. name: Soko-warekara Arimoto)

Heterocaprella clavigera Arimoto, 1976, Crustaceana, 30(1): 43–48, figs. 1–2.

Occurrence. Korean Straits (33°54.3'N, 128°23.0' E), in benthos, 1 male, Nov. 21, 1969, collected by Okada and Shojima, Coll. no. 698; Korean Straits (33°53.6' N, 128°33.4' E), in benthos, 1 male and 2 females, Feb.12, 1970, collected by Okada and Shojima, Coll. no. 699.
Type locality: Korean Straits.

6. *Protella gracills* Dana, 1853

(Jap. name: Warekaramodoki, Utinomi)

Occurrence. Korean Straits (34°05.3'N, 128°21.0'E), in benthos, 1 male, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 728; Korean Straits (33°53.6'N, 128°33.4'E), in benthos, 3 males, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 729.
Type locality: Korean Straits.

7. *Paracaprella insolita* n. sp.

(New Jap. name: Ijho-warekara)

(Fig. 6)

Occurrence. Korean Straits (33°40.6'N, 128°44.8'E), depth 0–50 m. 1 female, May 9, 1970 collected by Okada and Shojima, Coll. no. 514.

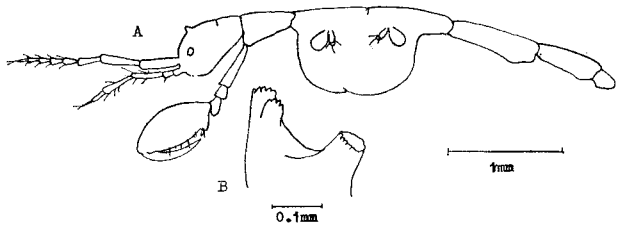

Fig. 6. *Paracaprella insolita* n. sp. A. adult female; B. mandible.

Description.

Female: Holotype: Body 4 mm long (Fig. 6, Coll. no. 514) smooth except for head; pereonite V longest, III and IV subequal in length, II and VI subequal and a little shorter than III; head with a projection above eyes.

Antenna 1 shorter than a half of body length, flagellum 5-segmented; antenna 2 a little longer than peduncle of antenna 1; molar tubercle of mandible prominent, with circular strongly denticulate crown.

Gnathopod 2 attached to the fore end of pereonite II, basal segment subequal to pereonite II in length, propodus big and approximately twice as long as broad, proximally with slightly projected palmar angle bearing a spine.

Pereopods 3 and 4 2-segmented, 5,6 and 7 missing.

Gills oblong, on pereonites III and IV.

Abdominal appendages, a pair of very small lobes.

Remarks. The present new species is related most closely to *P. crassa* but the former differs distinctly from the latter, in having a projection to head, instead of nonprojection and having lateral tubercles in female.

8. *Propodalirius insolitus* Mayer, 1903

(New Jap. name: Ijhogata-warekara)

(Fig. 7)

Propodalirius insolitus Mayer, 1903, Siboga Exped. Mon., 34: 62, pl. 2 fig. 30, pl. 7 figs. 33–36, pl. 9 figs. 46, 72.

Occurrence. Korean Straits (33°54.3'N, 128°23.0'E), in benthos, 2 males and 1 female, Nov. 21, 1969, collected by Okada and Shojima, Coll. no. 700; Korean Straits (33° 53.6'N, 128°33.4'E), in benthos, 1 female, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 701.

Description.

Young Male: Body 3 mm long (Fig. 7, Coll. no. 700), smooth; pereonite V longest, II, III and IV subequal in length, a little longer than a half of V, IV a half as long as III, I a little shorter than VI.

Antenna 1 very short, flagellum 3-segmented; antenna 2 as long as antenna 1 and furnished with setae. Incisor and molar tubercle of mandible strong.

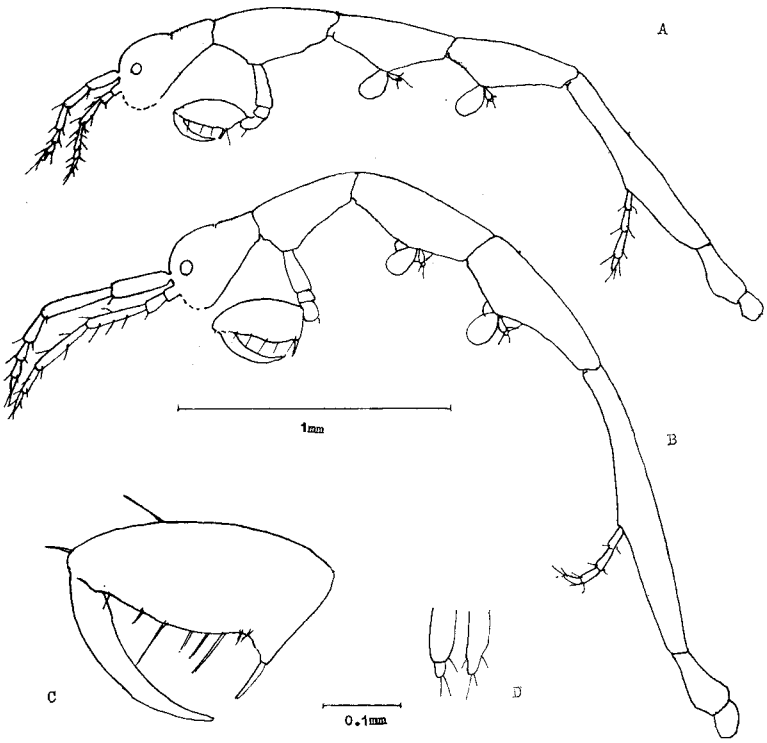

Fig. 7. *Propodalirius insolitus* Mayer. A. young male; B. young female; C. propodus of gnathopod 2 ;D. pereopods 3.

Gnathopod 2 attached to pereonite II slightly anteriorly to the middle; basal segment short, propodus small, twice as long as broad, basally the palmar margin with a small angle furnished with a long spine; pereopods 3 and 4 rudimentary and 1 or 2 segmented; pereopod 5 attached to the middle of pereonite V, about half as long as pereonite V, 4-segmented; pereopods 6 and 7 missing.

Gills on pereonites III and IV, oblong.

Abdominal appendages, a pair of appendages and a pair of lobes.

Young Female: Body 3.5 mm long (Fig. 7, Coll. no. 701); pereonites III and IV with a pair of small oostegites on the ventrolateral side; abdomen with a pair of appendages.

Distribution. Type localities: Koh Kouv and between Koh Mesan and Cape Liant, Thailand.

Remarks. This is the first record of the species from the Japanese waters.

9. *Caprella* (*Caprella*) *bathyalis* Vassilenko, 1972

(New Jap. name: Utsukushi-warekara)

(Fig. 8)

Caprella bathyalis Vassilenko, 1974, Skeleton Shrimps of Soviet Territorial Waters and its Neighboring Waters. Acad. Nauk. 107: 255–257, figs. 166–168.

Occurrence. Eastern Tsushima (34°25.7'N, 129°29.9'E), depth 0–50 m, 1 male, Nov. 19, 1969, collected by Okada and Shojima, Coll. no. 750; Eastern Korea (35°57.4'N, 129°16.2'E), in benthos, 1 male, Feb. 11, 1970, collected by Okada and Shojima, Coll. no. 747; Korean Straits (33°53.6'N, 128°33.4'E), in benthos, 21 males and 13 females, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 745, 746, 749; Korean Straits (32°53.8'N, 128°43.8'E), in benthos, 2 males, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 744; Yellow Sea (34°02.0'N, 122°15.0'E), depth 30 m, 1 male, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 799; Eastern Chechu Island (33°07.7'N, 127°33.2'E), in benthos, 2 males, Feb. 13, 1970, collected by Okada and Shojima, Coll. no. 743; East China Sea (31°47.4'N, 128°08.8'E), in benthos, 1 male, Feb. 14, 1970, collected by Okada and Shojima, Coll. no. 748; Korean straits (33°40. 6'N, 128°44.8'E), depth 0–50 m, 1 male, May 9, 1970, collected by Okada and Shojima, Coll. no. 696; East China Sea (30°32.5'N, 126°49.0'E), depth 90 m, 1 female, Nov. 10, 1975, collected by Ishiyama. Coll. no. 775.

Description.

Young male: Body 7 mm long (Fig. 8, Coll. no. 743), smooth; head rounded; pereonite V longest, II, III and IV subequal and all a little shorter than V.

Antenna 1 a little shorter than a half of the body length, flagellum 18-segmented; antenna 2 considerably longer than peduncle of antenna 1, furnished with setae.

Gnathopod 2 attached to the middle part of pereonite II; basal segment rather shorter than propodus, propodus long, twice as long as broad, the basic part markedly narrowed, proximally with slightly projected palmar angle having a spine, poison tooth

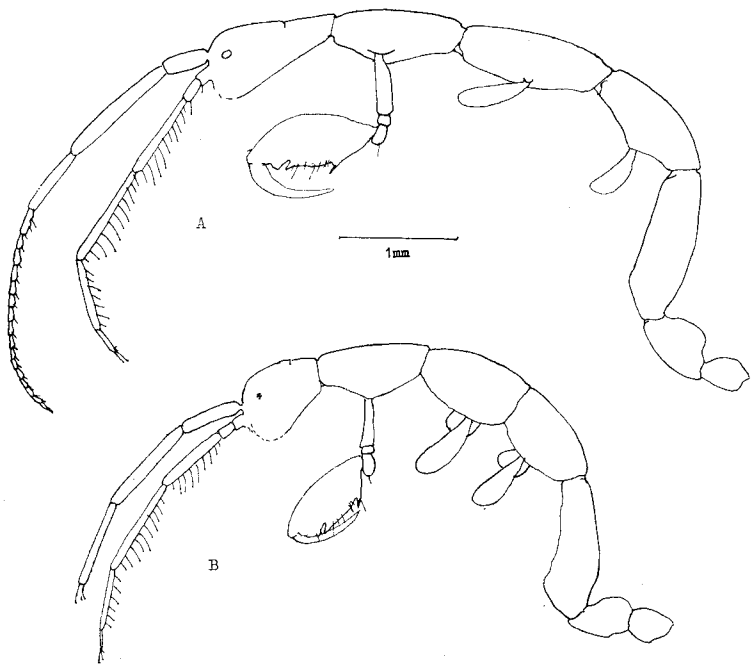

Fig. 8. *Caprella* (*C.*) *bathyalis* Vassilenko. A. young male; B. young female.

situated near triangular distal projection across a narrow notch.

Gills elongate, found on pereonites III and IV.

Young female: Body 7.5 mm long (Fig. 8, Coll. no. 775), smooth; pereonite V longest and I shortest; small oostegites on pereonites III and IV.

Distribution. Type locality: 46°33'N, 151°15'E.

Remarks. This is the first record in the Japanese waters.

10. *Caprella (Spinicephala) minuscula* n. sp.

(New Jap. name: Ko-warekara)

(Fig. 9)

Occurrence. Korean Straits (33°53.6'N, 126°33.4'E), in benthos, 1 male, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 518.

Description.

Male: Holotype: Body 4 mm long (Fig. 9, Coll. no. 518); pereonites II-V subequal in length; head with a blunt projection curved slightly forward above eyes, pereonites III-V with a ventrolateral tooth on each side near the fore end.

Antenna 1 about half as long as body, flagellum 8-segmented; antenna 2 a little shorter than peduncle of antenna 1. Gnathopod 2 attached near the fore end of pereonite II; basic segment a little shorter than pereonite II; propodus large and round, approximately more than twice as long as broad, proximal angle of palmar bearing two grasping spines, poison tooth medially.

Pereopods 5–7 missing.

Gills situated on pereonites III and IV, oval.

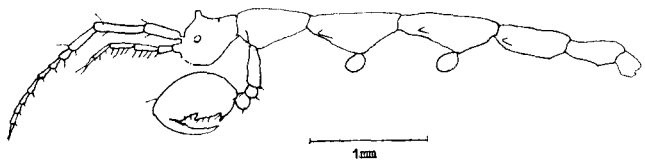

Fig. 9. *Caprella (Spinicephala) minuscula* n. sp., male.

Remarks. The present new speies is related on one hand most closely to *Caprella (Spinicephala) acanthifera*, but the former without any doroal spines differs distinctly from the latter having dorsal spines. On the other hand, the new species is related closely to *Caprella (Spinicephala) corvina* in that the head is provided with a projection anterioly above eyes, but the former having a lateral tooth on pereonites III-V differs distinctly from the latter without any lateral teeth.

11. *Caprella (Spinicephala) scaura typica* Mayer, 1890

(Jap. name: Kobutogenashi-warekara Arimoto)

(Fig. 10)

Occurrence. Yellow Sea (34°02.0'N, 122°15.0'E), depth 30 m, in benthos, 1 male, Nov. 20, 1968, collected by Okada and Shojima, Coll. no. 798.

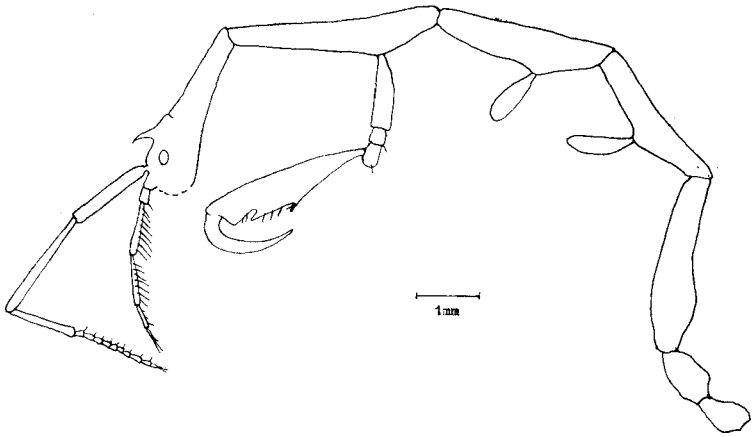

Fig. 10. *Caprella* (*Spinicephala*) *scaura typica* Mayer. Male.

Description.

Male: Body 16 mm long (Fig. 10); smooth except for head; pereonites II-V subequal in length, pereonite I a half as long as pereonite II; head with a spine above eyes.

Antenna 1 longer than a half of body length, flagellum 10-segmented; antenna 2 a little shorter than peduncle of antenna 1. Gnathopod 2 attached to pereonite II in its hind half; basal segment shorter than propodus; Propodus elongate, basic palmar portion very narrow, poison tooth with a narrow notch at the distal base against nearly triangular distal projection.

Type locality: River Noire, Mauritius.

Remarks. This specimen has not developed two pair of dorsal spines on pereonite V.

12. *Caprella* (*Spinicephala*) *gigantochir* Mayer, 1903

(Jap. name: Tenaga-warekara Utinomi)

(Fig. 11)

Occurrence. Korean Straits (33°48.1'N, 129°23.2'E), in benthos, 1 female. Nov. 20, 1969, collected by Okada and Shojima, Coll. no. 684; Korean Straits (33°54.3'N, 128°23.0'E), in benthos, 2 males and 1 female, Nov. 21, 1969, collected by Okada and Shojima, Coll. no. 694; Western Yamaguchi Pref. (34°12.3'N, 130°44.9'E), in benthos, 1 male and 1 female, Feb. 10, 1970, collected by Okada and Shojima, Coll. no. 682; Weastern Goto Islands (33°04.2'N, 128°47.8'E), in benthos, 5 males and 1 female, Feb. 11, 1970, collected by Okada and Shojima, Coll. nos. 685, 697; Eastern Tsushima Island (34°25.2'N, 129°32.0'E), in benthos, 2 males, Feb. 11, 1970, collected by Okada and Shojima, Coll. no. 691; Korean Straits (33°46.7'N, 129°29.8'E), in benthos, 1 female, Feb. 11, 1970, collected by Okada and Shojima, Coll. no. 693; Eastern Korea (35° 57.4'N, 129°16.2'E), in benthos, 1 male and 1 female, Feb. 11, 1970, collected by Okada

and Shojima, Coll. no. 692; Western Goto Islands (34°09.6'N, 129°02.1'E), in benthos, 1 male, Feb. 11, 1970, collected by Okada and Shojima, Coll. no. 683; Korean Straits (34°05.3'N, 128°21.0'E), in benthos, 11 males and 7 females, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 695; Korean Straits (33°40.2'N, 127°52.3'E), in benthos, 4 males, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 689; Korean Straits (34°05.3'N, 128°21.0'E), depth 0–50 m, 1 male, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 687; Korean Straits (33°53.6'N, 128°33.4'E), in benthos, 65 males and 35 females, Feb. 12, 1970, collected by Okada and Shojima, Coll. no. 686; East China Sea (32°23.8'N, 124°22.9'E), depth 0–50 m, 1 female, Mar. 10, 1970, collected by Okada and Shojima, Coll. no. 680; Western Goto Islands (33°40.6'N, 128°44.8'E), depth 0–50 m, 5 males and 7 females, May 9, 1970, Collected by Okada and Shojima, Coll. nos. 681, 690, 696; Korean Straits (34°03.9'N, 128°16.4E), in benthos, 1 male and 3 females, Nov. 21, 1970, collected by Okada and Shojima, Coll. no. 688.

Description.

Young male: Body 16 mm long (Fig. 11, Coll. no. 691); smooth except for head; basal segment of gnathopod 2 a half as long as pereonite II, the basic part of propodus shorter than in adult, very narrow.

Young female: Body 9 mm long (Fig. 11, Coll. no. 693); pereonite 1 shortest of all segments; gnathopod 2 attached rather anteriorly to pereonite II, basal segment of gnathopod 2 a half as long as pereonite II, the basic part of propodus short and very narrow; a pair of small oostegites on the ventrolateral side of pereonites III and IV.

Type localities: Enoura and Nagasaki.

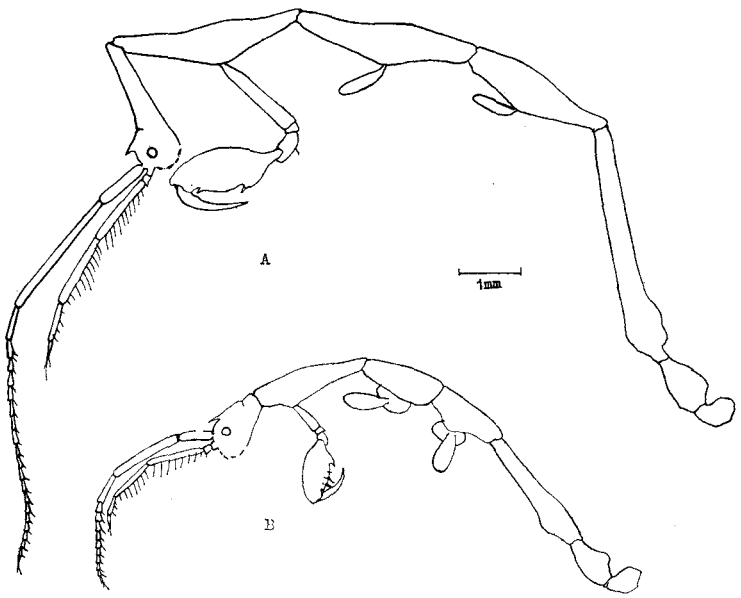

Fig. 11. *Caperlla* (*S.*) *gigantochir* Mayer. A. young male; B. young female.

13. *Caprella (Spinicephala) minima* n. sp.

(New Jap. name: Kogata-warekara)

(Fig. 12)

Occurrence. East China Sea (32°40.7'N, 127°00.8'E), depth 0–50 m, 1 male, Feb. 19, 1970, collected by Okada and Shojima, Coll. no. 515; Tsushima Straits (34°00.1'N, 130°01.9'E), in benthos, 1 female, Feb. 19, 1970, collected by Okada and Shojima, Coll. no. 516.

Description.

Young male: Holotype: Body 8.5 mm long (Fig. 12, Coll. no. 515); pereonites II and V subequal in length and longest; III and IV subequal and a little shorter than II; I and VI subequal and shorter than III; head bearing an acute frontal dosal spine, pereonites II-VI with a dorsal tooth around the middle, pereonites I and II with a dorsal tooth at the hind end, pereonites III and IV with a ventro-lateral tooth on each side near the fore end.

Antenna 1 longer than a half of body length, flagellum 18-segmented; antenna 2 shorter than peduncle of antenna 1, with swimming setae.

Gnathopod 2 attached to pereonite II a little posterior to the middle, basal segment short, propodus more than twice as long as broad, proximally with slightly projecting palmar angle bearing a spine.

Gills elongate, on pereonite III and IV.

Pereopods missing.

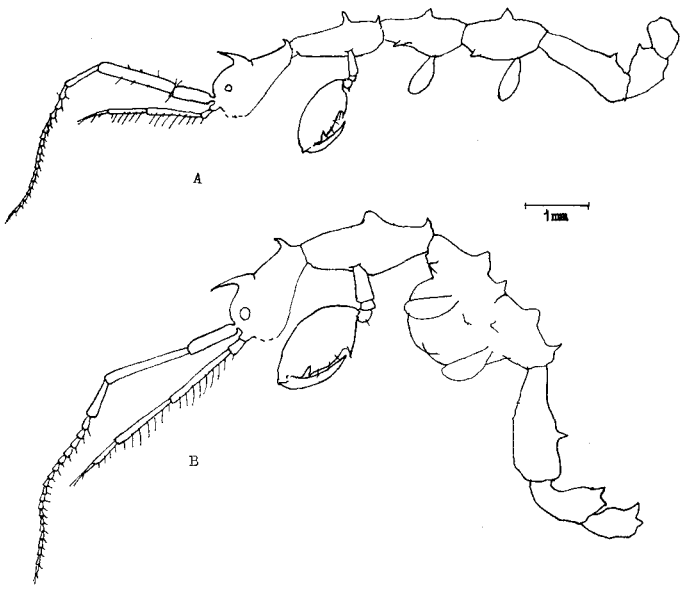

Fig. 12. *Caprella (S.) minima* n. sp. A. young male; B. adult female.

Female: Allotype: Body 10 mm long (Fig. 12, Coll. no. 516); a dorsal tooth at the distal end of pereonites I-IV and around the middle of pereonites II-V.

Remarks. The precent new spesies is related most closely to *Caprella* (*Spincephala*) *gorgonia* in that the ventrolateral tooth on each side near the fore end, but the former having a dorsal tooth around the middle differs distinctly from the latter without any dorsal tooth.

14. *Caprella* (*Spinicephala*) *simia* Mayer, 1903

(Jap. name: Kamate-warekara Utinomi)

Occurrence. Western Goto Islands (32°55.4'N, 128°45.0'E), depth 0–50 m, 7 males and 5 females, May 8, 1970, collected by Okada and Shojima, Coll. no. 752.

Type localities: Enoura and Nagasaki.

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